

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference E30757 HLA/JOB	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/NO 2003/000213	International filing date (day/month/year) 25.06.2003	Priority date (day/month/year) 26.06.2002
International Patent Classification (IPC) or national classification and IPC G06K 7/10, G07F 7/06		
Applicant Tomra Systems ASA et al		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>4</u> sheets, as follows:</p> <div style="margin-left: 40px;"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. </div> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							

Date of submission of the demand 23.01.2004	Date of completion of this report 04.10.2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Bo Gustavsson /OGU Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NO 2003/000213

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1 - 5 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* 6, 7 as amended (together with any statement) under Article 19

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1/3 - 3/3 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-7</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-7</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)**Documents cited in the International Search Report:**

D1: US 2001 042 789 A1

D2: US 5 593 017 A

The invention relates to a device for recognising a container by means of a marking provided on its surface. A problem associated with systems for recognising container markings is that the surface of the container or the marking may be irregular. In order to eliminate these problems, the invention uses a system comprising one imager (camera) and an arrangement of mirrors enabling the imager to obtain two images from different directions relative to the marking.

After the amendments of the claims, wherein the invention has been clarified by specifying the positions of the mirrors relative to the imager, the documents cited in the International Search Report now only represent the general state of the art.

The invention defined in claims 1-7 is therefore not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed device for recognising a container. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-7 is novel and is considered to involve an inventive step. The invention is industrially applicable.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Art. 19 kran

Via facsimile to: 00 41 22 740 14 35
(Confirmation copy by regular mail)

23 January 2004

Your ref.: PCT/NO03/00213
Our ref.: E30757 hla

International Patent Application No: PCT/NO03/00213 - Tomra Systems ASA, et al.

Referring to the International Search Report (ISR) dated 12 December 2003, we hereby submit amended claims (enclosed) supported by the following comments and observations.

The ISR cites US 2001042789 A1 as being of particular relevance regarding novelty and inventive step.

The cited publication discloses (figure 3) a device with two transparent scanning surfaces (windows) at an angle to one another, and two fixed mirrors and one moving mirror for use with a single image sensor. The cited device requires that the camera is synchronized with the moving mirror. Furthermore, the cited device produces the two images in a time sequence.

The international application discloses a device having two independant mirror pairs, where a mirror of the first pair is placed adjacent to a mirror of the second pair, and both adjacent to the camera optical axis. The invented device comprises a stationary geometrical and optical arrangement, simultaneously yielding two different view fields into a single camera exposure.

The imaging is effected by at least a first pair (5, 6) and a second pair (7, 8) of mirrors, where the mirrors in each pair are facing one another and where the pairs are positioned on opposite sides of the optical axis of said camera (1), one mirror (5) of the first pair being fixedly positioned adjacent to one mirror (7) of the second pair, at an angle to said axis, whereby said selected portions are shown as respective mirror images in the respective mirror (5, 7) and two areas along the longitudinal direction of the container (3), optionally including one or both end faces, are imaged simultaneously by the camera (1).

Claim 1 has been amended to better distinguish the invention from the cited prior art.

Yours faithfully
Zacco Norway AS

[Signature]
Hans Langan

Enclosures: Amended claims (two sheets)

PATENT COOPERATION TREATY

12-03-2004 20

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NOTIFICATION CONCERNING
AMENDMENTS OF THE CLAIMS(PCT Rule 62 and
Administrative Instructions, Section 417)

From the INTERNATIONAL BUREAU

To:

Swedish Patent Office
P.O. Box 5055
S-102 42 Stockholm
Sweden

Date of mailing (day/month/year)

24 February 2004 (24.02.2004)

in its capacity as International Preliminary Examining Authority

International application No.

PCT/NO2003/000213

International filing date (day/month/year)

25 June 2003 (25.06.2003)

Applicant

TOMRA SYSTEMS ASA et al

The International Bureau hereby transmits a copy of the amendments to the claims under Article 19 together with any accompanying statement (Rule 62).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 338.87.20

Authorized officer

Catherine MARQUIS (Fax 338-87-20)

Telephone No. (41-22) 338 9142

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

**NOTIFICATION CONCERNING
THE FILING OF AMENDMENTS OF THE CLAIMS**
(PCT Administrative Instructions, Section 417)

To:

16 FEB 2004

LANGAN, Hans
Zacco Norway As
P.O. Box 765, Sentrum
N-0106 Oslo
Norway

Date of mailing (day/month/year) 09 February 2004 (09.02.2004)	
Applicant's or agent's file reference E30757 HLA	IMPORTANT NOTIFICATION
International application No. PCT/NO2003/000213	International filing date (day/month/year) 25 June 2003 (25.06.2003)
Applicant TOMRA SYSTEMS ASA et al	

1. The applicant is hereby notified that amendments to the claims under Article 19 were received by the International Bureau on:

23 January 2004 (23.01.2004)

2. This date is within the time limit under Rule 46.1.

Consequently, the international publication of the international application will contain the amended claims according to Rule 48.2(f), (h) and (i).

3. The applicant is reminded that the international application (description, claims and drawings) may be amended during the international preliminary examination under Chapter II, according to Article 34, and in any case, before each of the designated Offices, according to Article 28 and Rule 52, or before each of the elected Offices, according to Article 41 and Rule 78.

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. (41-22) 338.87.20</p>	<p>Authorised officer</p> <p>Bernard THORAX</p> <p>Telephone No. (41-22) 338 8213</p>
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6-8

A m e n d e d P a t e n t C l a i m s

1.

- 5 A device for recognising a container, such as a bottle or a can, comprising a camera and light emission means (1, 2) arranged for imaging a selected portion of the container (3), said camera and light emission means being connected to a processor or the like adapted for recognition, based on a camera-recorded image, of special features related to the container, *characterised in that*
- 10 said imaging is effected by at least a first pair (5, 6) and a second pair (7, 8) of mirrors, where the mirrors in each pair are facing one another and where the pairs are positioned on opposite sides of the optical axis of said camera (1), one mirror (5) of the first pair being fixedly positioned adjacent to one mirror (7) of the second pair, at an angle to said axis,
- 15 whereby said selected portions are shown as respective mirror images in the respective mirror (5, 7) and two areas along the longitudinal direction of the container (3), optionally including one or both end faces, are imaged simultaneously by the camera (1).

20 2.

A device according to claim 1, characterised in that the line of intersection between the mirror faces (5, 7) adjacent to the optical axis of the camera is essentially perpendicular to the optical axis, these mirror faces being positioned symmetrically and directed in the opposite direction to each other.

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3.

A device according to claim 2, characterised in that the mirror faces (5, 7) adjacent the optical axis of the camera are so positioned that one of their sides edges meet.

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4.

A device according to claim 2, characterised in that the mirror faces (5, 7) adjacent to the optical axis of the camera are offset relative to each other along the optical axis.

5.

- 35 A device according to any one of the preceding claims, characterised in that the mirror surfaces (5, 6, 7, 8) in each pair are positioned obliquely relative to each other.

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2 9

6.

A device according to any of the preceding claims, characterised in that the imaging is carried out when the container (3) is on a conveyor (4) provided in a reverse vending machine for beverage containers.

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7.

A device according to any one of the preceding claims, characterised in that the processor comprises a comparator adapted to recognise, on the basis of the image selected by the processor, the respective areas along the longitudinal direction of the container (3) on comparison with a reference archive.

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